Ownership, visibility and effort: golf handicaps as proxies for managers' extra effort

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Abstract: Economics suggests that owners, CEOs and chairmen have different claims in a company's output, and thus that these groups exert different efforts. However, the effort an agent invests in his/her firm is difficult to measure. Golf handicaps enable us to look into the relationship between different degrees of ownership and their implications for the effort that agents exert. Handicaps have the advantage that they can be directly observed and can be viewed as a mirror image of a manager's effort. We expect that times of crisis and changes in management positions influence golf handicaps, mostly for owners and, to a lesser extent, for CEOs and chairmen. Data of 440 Swiss top managers and their handicaps during eight years, from 2003 to 2010, strongly support this assumption.

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Ownership, Visibility and Effort: Golf Handicaps as Proxies for Managers' Extra Effort

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I. INTRODUCTION

How much effort does an employee exert in his/her firm and how can we measure this effort? These questions have been a topic of researchers for decades now. Depending on the tasks and position of the employee, several solutions have been developed. For top managers, the degree of ownership seems to be an important factor. The relationship between different degrees of ownership and their implications for the effort agents exert has been analyzed extensively in economics (e.g. Stiglitz, 1974; Jensen and Meckling, 1976). While there are many empirical tests for this relationship, we find almost no direct tests that control for the way agents allocate their time between business and leisure activities in a changing economic environment. Prior empirical research has tested this relationship between degree of ownership and effort exerted by using firm performance as a proxy for agent's effort (e.g. Morck et al., 1988; Kroll et al., 1997; Core et al., 1999; Anderson and Reeb, 2003; He, 2008). Firm performance is, however, a very noisy signal for individual management performance and effort, and it is little surprise that there is no evidence of a systematic ownership-effort link (Dalton et al., 2003).

The present study tries to fill this research gap. We use data from a natural experiment, namely how golf handicaps of top managers have developed before and after management-position changes before the global financial crisis, i.e., from the year 2003 to 2007, and during the global financial crisis, i.e., from the year 2008 to 2010. Golf handicaps are a numerical representation of a golfer's playing potential: the lower the number, the better the golfer (McHale, 2010; USGA, 2010). This particular measurement is used because golf handicaps, which have the advantage that they can be directly observed, can be seen as a mirror image for firm effort.

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Improving a handicap is hard work and time consuming and thus represents time taken away from business affairs. We analyze position changes because, especially when a new position is more demanding, actors are less likely to divert their time away from the firm to leisure activities that have no direct business impact. For example, former CEOs or chairmen who buy and manage a company are more committed to the company's success compared to their commitment in former management positions. This implies that they have less time to practice golf and to improve their handicap in their new position as owner.

This particular time interval is analyzed because, especially in a crisis, actors do not want to be seen as diverting their time away from firm activities to leisure activities. In a crisis, we should expect that managers' golf handicaps worsen, because of the extra effort now needed in their firms; managers have less time to exercise on the golf course and thus to improve their handicap.

By differentiating between three types of top managers with different degrees of firm ownership – owner-managers, CEOs, and chairmen – we expect that, for management-position changes and in times of crisis, golf handicaps deteriorate most for owners or for managers who have become owners. For CEOs, the handicap should also deteriorate during times of crisis, but to a lesser extent. Also, moving from a chairman position into a new CEO position should worsen the handicap. However, if the new CEO is an owner, the handicap should improve. As far as we know, this is the first paper that uses golf handicaps as an alternative measurement for top managers' effort. By using golf handicap changes, we show that different degrees of ownership are associated with different degrees of management effort.

The remainder of the paper is structured as follows. In Chapter II we explain differences between top management actors and argue why former proxies to measure management efforts are problematic and why golf handicaps can be seen as a suitable effort proxy. In Chapter III, we introduce our dataset. Our empirical results are discussed in Chapter IV. In Chapter V, we conclude and give an outlook for future research.

II. GOLF HANDICAPS AS PROXIES FOR MANAGER'S EXTRA EFFORT

II.1. Difference between management actors

Usually the three groups of actors – owner-manager,[1] CEO[2] and chairman – have different claims to the company profit besides their fixed income. The

1. In almost every case in our sample, an owner-manager is also the founder of the firm or a relative of the founder. For our argument, we do not differentiate between owner and founder. (In the owner case it is also possible, that he/she both controls and manages the business.)
2. In this context, a CEO means a professional CEO holding no, or only a spare, share of the firm in order to differentiate CEOs from owners.

owner-manager (o) of a firm acts as both principal and agent (Durand and Vargas, 2003). CEO (ceo) and chairman (ch) both act as agents for the owners of the firm (Jensen and Meckling, 1976). For owner-managers there is no principal-agent conflict and assuming that they own more shares than CEOs or chairmen, owners should have a higher claim to the company output.

Further, we can assume that *ceteris paribus* a CEO is more dependent on the success of a company than the chairman of the board. Chairmen are better diversified than CEOs. Usually they have shares, management roles and chairs in different firms. Therefore, they are generating income from more than one source. We also know that the compensation of CEOs is more incentive based than the compensation chairmen receive. CEOs can leverage their compensation by increasing firm performance (Tosi et al., 2000). Compensation of chairmen depends more on factors such as firm complexity and risk (Brick et al., 2006).

When we put these assumptions together, the result is that actors have different claims to company output, with owners having the highest claim and chairmen the lowest ($\alpha_o > \alpha_{ceo} > \alpha_{ch}$).

These different claims can be explored by focusing on managers who change their position. A manager who leaves his/her CEO or chairman position and becomes an owner-manager of a firm, e.g., by buying or founding it, should have a very high interest in being successful with his/her new firm. The new owner therefore has less time left for leisure activities and spends more time on his/her business. Similar effects should occur for a chairman who has taken over a CEO position. He/she is now more committed to a single company, and, due to typical incentive systems, has a higher stake in the company output than before. Compared to new owners, effects should be smaller for new CEOs, because of principal-agent conflicts in the CEO situation. For persons who sell their company, the new position (i.e., CEO or chairman) is associated with a lower stake in the company output, with the result that more time is diverted into leisure activities. Again, the same effect, but in a smaller magnitude, should appear for CEOs who give up their managing position in order to operate as chairman.

We assume that the income of the economic actors consists of wage "w" and some return α_i to their extra effort exerted in an economic crisis (Stiglitz, 1974; Jensen and Meckling, 1976):

$$Y = \alpha_i * \text{extra} + w; \text{ with extra} = e^{\beta} \quad (1)$$

This extra effort assumes that there is an unspecified normal effort, which is not observable. In our study, this extra effort reflects reactions by the different economic actors in a situation of economic crisis. A crisis is assumed to demand more managerial effort by the actors at the margin in order to meet specific business challenges. Originally formulated by Kahneman and Tversky (1984), the basic idea behind extra effort in crisis is loss aversion of individuals.

The authors show that individuals have a higher preference in avoiding losses than in acquiring gains. If an individual loses $100, the impact on the utility is larger than when the same person wins $100 (Kahneman and Tversky, 1984; Tversky and Kahneman, 1991). Applied to a situation of economic crisis, a manager who owns a company is more motivated to invest extra effort, compared to a CEO or a chairman. In short: the more you own, the more you stand to lose in a crisis.

The partial output elasticity of "extra" with respect to effort "e" is captured by "β" with $0 < \beta < 1$ (we could even assume that the size of β changes from a normal situation to a crisis). Assuming that the three groups of actors equate the time share of their marginal productivity to their marginal cost of extra effort "$c'(e)$" with $c'(e) > 0$ to (1), we get:

$$\alpha_i \beta e^{\beta-1} = c'(e) \tag{2}$$

All actors have the same β and therefore only the contract parameter α_i matters for the supply of extra effort (by definition the effort for $\alpha_o = 1$ would be optimal). This basic idea must, of course, be adapted when particular competitive environments and monitoring technologies, etc., prevail. We do not need additional assumptions, such as for example that monitoring is less effective in managerial jobs and could lead to crowding out of intrinsic motivation (Frey, 1992).

II.2. Firm performance as a proxy of manager's effort

Prior research has tested the assumptions above by relying on firm performance as a proxy for manager's effort. The more extensive the ownership, the more effort an agent is willing to put into his/her firm. For example, Morck et al. (1988) find evidence that the market valuation of a firm increases with the level of management ownership. Similarly, Core et al. (1999) find that firms with low levels of management-ownership perform worse. He (2008) and Anderson and Reeb (2003) show evidence that founders, who typically own the company, are better CEOs than non-founders. Kroll et al. (1997) demonstrate that for manager-controlled firms, acquisition announcements result in negative excess returns to shareholders, while for owner-manager-controlled firms, such announcements result in positive excess returns.

Typically, firm performance is used to capture the effort a manager exerts in his/her firm. However, firm performance may not be the best measurement of effort, especially not in a multi-agent situation under uncertainty. Several problems accompany the use of firm performance: First, the applied performance measures are generally very noisy signals and do not necessarily directly measure the performance of management nor of a particular manager (Morck

et al., 1988). Managers typically have only a small impact on corporate performance (Daily and Dalton, 1992). A meta-analysis consequently supports that there is little evidence of a systematic ownership-performance link (Dalton et al., 2003), results that were also shown by Kania and McKean (1976).

Second, professional CEOs may be incentivized to behave myopically due to their performance-evaluation system. They are often more interested in maximizing short-term returns rather than maximizing the long-term profitability, because in doing so, they maximize their own income. In contrast, an owner identifies himself much more with his/her company and is more interested in long-term success (James, 1999; Anderson and Reeb, 2003). Explicit contracts focusing on specific actions could cause agents only to invest effort on these specific actions (Prendergast, 1999). Due to the dependence of CEOs' payments largely on the stock performance of a firm, CEOs will concentrate on actions with beneficial effects on stock performance. As a result, the often-used performance measurements test short-term effort instead of long-term firm success, and thus may overestimate the effort of some CEOs and underestimate the effort of others.

Third, performance measures are prone to manipulation. On the one hand, agents can be motivated to game measurements in order to generate results that will be better than the true value. On the other hand, the principal may want to keep success low (Prendergast, 1999). Taken all together, these findings indicate that firm performance may be not the best measure to test the true value of effort an agent contributes.[3]

II.3. Golf handicaps as a proxy of manager's extra effort

In order to find other measures of the manager's (extra) effort, we change the perspective. Instead of firm performance, we look at individual effort directly by using the leisure activities of a top manager as a mirror image for effort. The idea is that the more time a manager spends on his/her leisure, the less time he/she can invest in work activities. The sport of golf seems to be suitable here: Golf is very popular among managers, with many managers spending a considerable portion of their scarce spare time on the golf course (Ceron-Anaya, 2010).

The popularity of golf among managers can be explained by its historical and sociological roots. "The sport required a mind-set such as daring attitudes and strategic thought, aspects that were also present in the daily life of any

3. Results could change when other measurements than firm performance are used. Frick's (2004) study that used product quality as an indicator for manager's performance finds conflicting results regarding the agency theory. The results show that firms ruled by an owner-manager produce wine of lower quality than firms with an employed manager on the top. While this result is not in line with our theory, it could be explained by the missing human capital of owner-managers and the specific characteristics of the wine industry.

businessmen. The time necessary to play a round of golf meant extended opportunities to network and form rapport among business partners. Golf symbolically represented the fight against nature that businessmen constantly confronted in their work. This game, as any other sports, created a relaxed environment, which induced more friendly interactions. The combination of individualism and peer-trust engendered by golf were fundamental components in economic environments. The game therefore became a metaphor for what the business world was about." (Ceron-Anaya, 2010: 355) For example, in 2005, Newsweek explained, "more and more Business Schools offer classes on golf [. . .] a common element of corporate life, so students learn how to handle themselves on the green" (Di Meglio, 2005). While the networking aspect of golf underlines the usefulness of the sport for business activities, the case is different for improving golf handicaps. Malmendier and Tate (2009) point out that one could view golf handicaps as a measure to divert effort from the firm into leisure activities by showing that award-winning CEOs have significantly lower golf handicaps than non-winners, consistent with more time spent on leisure activities, and consistent with the observation that golf is more common in firms with poor corporate governance. Their focus is not on studying the manager's effort by golf handicaps. Instead they compare firm performance of award-winning CEOs with non-award-winning CEOs. The golf handicap here is only one of several measures for activities that distract the manager's attention from business activities. Generally, to improve your handicap you should invest more time solely concentrating on your game both on the driving range and on the golf course. Playing with business partners only in order to network or negotiate business deals will not improve the handicap. Therefore, a golf handicap – that represents the playing potential of a golfer – can be seen as a mirror-image measure of effort and has the great advantage of being directly observed.

Using golf handicaps, our aim is to look into the relationship between different degrees of ownership and their implications for the extra effort that agents exert, especially when they change management positions and in times of economic crisis. Please note we do not make inferences about how the different economic actors have acquired their respective golf handicaps.[4] We concentrate on the change in golf handicaps after a management-position change or during an economic crisis and we are not interested in the initial score of the handicap.

We argue that handicap improvements are very time consuming. In that respect, we expect that, especially when persons change their management positions, they exercise different levels of effort within the new position. We measure this effect by looking at the changes in handicaps. We compare

4. Different handicap levels could be explained by having different access to golf lessons. For example an owner being heir, may have gained more golf experience at a younger age compared to an aspiring manager with a modest background.

developments before and after the position change in order to see whether actors change their behavior and invest more or less time in business operations.

Because of the different stakes in the company output described above, we expect that handicaps change for management actors in different magnitude and different directions. We should generally find that the handicaps of owners react more to management-position changes than the handicaps of CEOs. Further, the handicaps of CEOs should react more to management-position changes than the handicaps of chairmen. The different stakes in the company output are associated with spending a different amount of time in the golf handicap training, which should result in different handicap development. It implies that – compared to all other possible positional changes – persons who become owners invest the most time in business operations, i.e., their handicaps worsen the most. Vice-versa, persons who exit the (labor) market, which means they give up their CEO or chairman position, should have a lot of time for exercising golf and their handicaps are likely to improve most. Between these extreme groups we should find differences in the efforts of chairmen becoming CEOs, of CEOs becoming chairmen and of owners becoming employed managers, i.e., becoming CEO or chairman. We expect the following results for these management-position changes: chairmen becoming CEOs should exert more effort compared to CEOs becoming chairmen, i.e., the handicap of the first group (chairmen becoming CEO) worsens, because they invest more time in business affairs as CEOs. The handicap of the second group (CEO becoming chairmen) are likely to improve, because these new chairmen are likely to spent more time on the golf course compared to their time as CEO. Further, owners becoming employed managers (CEOs or chairmen) lower their efforts in business operations more than CEOs becoming chairmen. Underlying this is the assumption that effort changes are highest if persons change from an owner position to an employed position, and vice-versa.

Hypothesis 1a. *Golf handicaps worsen most when managers become firm owners, followed by chairmen becoming CEOs.*

Hypothesis 1b. *Golf handicaps improve most when managers leave the (labor) market, followed by owners becoming employed managers and followed by CEOs becoming chairmen.*

Furthermore, we expect that, especially in a crisis, namely in the global economic crisis that started in 2007/2008, no actor wants to be seen investing time or having the time for improving his/her golf handicap. We compare developments before and during the crisis in order to see whether actors changed their behavior and invested more time in business operations.

The argument that golfers spent less time playing golf during the crisis is also supported by the operation figures of golf clubs. A majority of golf courses reported a decrease in rounds and revenues in 2009 (KPMG, 2010). In addition,

we can find evidence that a crisis influences the effort of individuals: Lazear et al. (2013) show that individuals work harder during a recession.

Taken all together, we expect that in a crisis, handicaps worsen for all management actors,[5] but in different magnitude. Because of (2) we should find handicaps of owners to worsen more than the handicaps of CEOs. Furthermore, the handicap of CEOs should deteriorate more, compared to the handicaps of chairmen.

Hypothesis 2. *In times of crisis, golf handicaps worsen most for owners, followed by CEOs and then chairmen.*

III. DATA

The dataset used for the analysis consists of 440 Swiss top managers and their handicaps during eight years, i.e., from 2003 until 2010.[6] The handicaps and the position of top manager are taken initially from annually published data in the Swiss economic magazine "BILANZ". We combined these data with our own research, checked the position and the company of every manager by hand, made adjustments where necessary, and built four actor categories: Owner, CEO, chairman and golfer who do not belong to any of the three groups (mainly these are former CEOs or former chairmen). The last group serves as the reference group in our regression models.

The companies in our sample are from different industries with an overrepresentation of the financial industry (about one third of the sample). In the dataset we obtain 132 management-position changes that are relevant in order to test Hypotheses 1a and 1b. As shown in Table 1, we coded positional changes by ascertaining from which to which position a person switched. In our sample 14 persons become owners, 15 chairmen become CEOs, 39 CEOs become chairmen, 12 owners become employed managers (CEOs or chairmen) and 52 managers exit the (labor) market. Overall we obtain: (1) 64 person-years (i.e., we used 64 handicap observations) before the position change and 48 person-years after the position change for persons becoming owners; (2) 73 person-years before the position change and 47 person-years after the position change for chairmen becoming CEOs; (3) 179 person-years before the position change and 125 person-years after the position change for CEOs becoming chairmen; (4) 54 person-years before the position change and 42 person-years after the position change for owners becoming employed managers; and (5) 304

5. Worsening means that the handicap figures increase. Therefore, a golfer whose handicap changed from 20 to 21 within a year has lost playing potential.
6. The rankings are published at the beginning of each year, i.e., the ranking of 2010 measures handicaps of the year 2009. We considered this time lag by allocating each ranking to the preceding year. The number of managers from which a handicap is obtained is as follows: 2003 = 197, 2004 = 278, 2005 = 291, 2006 = 257, 2007 = 284, 2008 = 303, 2009 = 300 and 2010 = 312.

Table 1

Management-Position Changes in the Dataset

Management-Position Changes	Number of Persons	Number of CEOs	Number of Chairmen	Number of Owners	Number of former CEOs/Chairmen	Number of Person-Years before Position Change	Number of Person-Years after Position Change
Become an Owner	14	3	7	0	4	64	48
Chairman becomes CEO	15	0	15	0	0	73	47
CEO becomes Chairman	39	39	0	0	0	179	125
Owner becomes CEO/Chairman	12	0	0	12	0	54	42
(Labor)Market Exit	52	35	17	0	0	304	112

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In our analysis we further differentiate between two time periods: The first period from 2003 to 2007 describes economic times in boom markets, while the second period from 2008 to 2010 captures the years of the global financial crisis.

We apply random-effects models to test our hypotheses, i.e., we consider that our dataset consists of a hierarchy of different individuals whose differences relate to that hierarchy.

In order to control for unobserved heterogeneity, we additionally include the age group of a person, the company profit, the weather, year dummies and industry sector dummies. Persons were divided into age groups ranging from 1 (persons aged 21–30 years) up to 7 (persons aged 81–90 years). Age groups have been built by using publicly available data, such as CVs or self-portrayals of the managers. As excellence in golf only slightly depends on physical fitness, we expect older persons are better golfers because they had more time to practice the sport. This relationship is probably only a tendency and golfers belonging to the last category may be not as good as golfers 10 or 20 years younger. Further, we include company profit measured by the logarithms of EBIT in Swiss Francs. When company profit decreases, top managers are under pressure. They should have less time for golfing and we expect handicaps to worsen when profits are dropping. In order to differentiate between small and big companies, we use the number of employees working for a company. Every firm with more than 100 employees is defined as a bigger firm. In our dataset, around 41 percent of firms fall into this category. Company-related data are gathered by using financial or other official company reports. Weather has been measured by the number of sun hours in Switzerland within each year. It seems plausible that people play more golf if the weather is excellent and therefore it is more likely for handicaps to improve faster. Data about the weather is taken from Switzerland's national weather and climate service "MeteoSwiss". Finally, we include year and industry sector dummies. Year dummies are important in order to control for general handicap improvement within the sample, for example, due to learning over time. Additionally, the year dummies enable us to include a crisis-interaction variable. Sector dummies may be important if the significance of golf for business differs between industry sectors.

IV. RESULTS

Table 2 reports the descriptive statistics and correlations of the used variables.[7]

7. Please note that we have one really excellent golfer in our sample whose handicap is even better than 0. Hence his handicap has a negative sign indicating that it is above 0.

Table 2

Descriptive statistics

ID	Variable	Mean	Std.Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Handicap	18.64	7.82	−.20	36.00															
2	Owner	.16	.36	.00	1.00	−.20														
3	CEO	.36	.48	.00	1.00	.01	−.33													
4	Chairman	.39	.49	.00	1.00	.10	−.35	−.59												
5	Become an Owner	.01	.11	.00	1.00	.00	.34	−.11	−.12											
6	Chairman becomes CEO	.01	.11	.00	1.00	−.08	−.07	.20	−.12	−.02										
7	CEO becomes Chairman	.03	.18	.00	1.00	.05	−.11	−.18	.30	−.04	−.04									
8	Owner becomes CEO/Chairman	.01	.11	.00	1.00	−.10	−.06	−.01	.08	−.02	−.02	−.03								
9	(Labor)Market Exit	.03	.17	.00	1.00	.05	−.10	−.14	−.18	−.03	−.03	−.05	−.03							
10	Owner * Crisis	.06	.24	.00	1.00	−.13	.59	−.19	−.21	.30	−.04	−.06	−.03	−.06						
11	CEO * Crisis	.13	.34	.00	1.00	−.03	−.18	.54	−.32	−.06	.21	−.10	.03	−.08	−.10					
12	Chairman * Crisis	.15	.36	.00	1.00	.04	−.19	−.33	.55	−.07	−.06	.27	.09	−.10	−.11	−.18				
13	Age group	4.66	.75	1.00	7.00	−.01	.02	−.12	.04	.04	.06	.02	.02	.07	.04	−.01	.09			
14	Company Profit (log)	18.60	1.37	9.15	24.28	.00	.00	.05	−.10	−.02	.03	−.02	.00	.02	−.01	.03	−.05	.00		
15	Firmsize	.41	.49	.00	1.00	.12	−.27	.07	.08	−.04	−.01	−.01	−.12	.10	−.15	.00	.02	−.01	.00	
16	Weather	1876.45	127.62	1685.16	2135.99	.02	.00	.02	.00	−.02	−.04	−.05	−.03	−.09	−.17	−.26	−.28	−.20	−.01	.04

Table 2 documents the descriptive statistics and bivariate correlations for the variables used in Tables 3 and 4. For reasons of clarity, the table does not include sector- and year-dummies. The number of observations is N = 2222.

Table 3 documents the random-effects regression results by using golf handicap as dependent variable. Model a is the basic model. The model entails the control variables and the (year-specific) general effects of a management position within our dataset. All management actors of interest are added as a binary variable in the regression; the group of retired managers (especially former CEOs and former chairmen) serves as control group and is not included in the model. Model a is, however, not a test for our hypotheses. It only makes inferences about how the different management-position holders differ in their golf handicaps. In Model b we therefore extend Model a by including the effects of a management-position change on the development of golf handicaps. We test how each position holder's initial handicap scores change when the manager switches his/her position. The variables compare the handicap of one person before the position change with the handicap after the position change. For example, the variable "Become an Owner" tests the score of the handicap of one person being CEO or chairmen, with the situation of being an owner in later years. In Models c-f we extend Model a by considering the changes in golf handicaps during the economic crisis, i.e., we test how each position holder's initial handicap scores change during the financial crisis. In the following we discuss the findings of each model.

As indicated in Model a, the handicaps of owners, CEOs and chairmen do not significantly differ from the handicaps of retired managers. The Wald test further shows that the handicaps of owners do not significantly differ from the handicaps of CEOs and chairmen and that the handicaps of CEOs and chairmen do not significantly differ from each other. The findings thus show that no management actor group has acquired better golf handicaps as another group, for example due to more golf experiences at a younger age.

Model b additionally considers positional changes between management groups. Compared to management actors with no positional change during the observed time period, handicaps significantly deteriorate by 2.13 ($p < 0.001$) for persons who become owners; chairmen becoming CEOs face no significant handicap mutations; CEOs becoming chairmen slightly improve their handicaps by −.68 ($p < 0.10$); owners becoming CEOs or chairmen noticeable improve their handicaps by −1.24 ($p < .05$); and person who exit the (labor) market strongly improve their handicaps by −2.17 ($p < .001$).

With respect to Hypotheses 1a and 1b we further test the differences between the former management groups. The findings reveal that the parameter for "Become an Owner" is significantly different from "Chairman becomes CEO" (chi2 = 6.45, $p < .05$), "CEO becomes Chairman" (chi2 = 12.85, $p < .01$), "Owner becomes CEO/Chairman" (chi2 = 9.00, $p < .01$) and "(Labor)Market

Table 3

Regression Results

Random effect model Handicap as dependent variable	**Model a** B (SE)	**Model b** B (SE)	**Model c** B (SE)	**Model d** B (SE)	**Model e** B (SE)	**Model f** B (SE)
Management Position (Reference Retirees)						
Owner	−.35	−3.72***	−.65†	−.36	−.33	−.53
	(.34)	(.77)	(.35)	(.34)	(.34)	(.38)
CEO	−.18	−2.20***	−.25	−.11	−.14	−.08
	(.22)	(.49)	(.22)	(.23)	(.22)	(.29)
Chairman	−.28	−1.82***	−.32	−.28	−.15	−.16
	(.23)	(.49)	(.23)	(.23)	(.24)	(.28)
Management-Position Changes (Reference No Position Change)						
Become an Owner		2.13***				
		(.68)				
Chairman becomes CEO		.08				
		(.41)				
CEO becomes Chairman		−.68†				
		(.35)				
Owner becomes CEO/Chairman		−1.24*				
		(.61)				
(Labor)Market Exit		−2.17***				
		(.50)				
Management Positions within the Crisis (Reference No Crisis)						
Owner × Crisis			.66***			.41
			(.21)			(.34)
CEO × Crisis				−.21		−.28
				(.18)		(.31)
Chairman × Crisis					−.26	−.27
					(.16)	(.30)
Age group	.16	.18	.19	.17	.17	.19
	(.17)	(.17)	(.17)	(.17)	(.17)	(.17)
Company Profit (log)	−.03	−.03	−.03	−.03	−.04	−.04
	(.05)	(.05)	(.05)	(.05)	(.05)	(.05)
Firmsize	.02	−.08	−.02	.01	.02	−.02
	(.25)	(.25)	(.25)	(.25)	(.25)	(.25)
(Reference sector 6)						
sector_1	−2.67	−2.57	−2.67	−2.67	−2.66	−2.66
	(2.44)	(2.43)	(2.45)	(2.44)	(2.45)	(2.44)
sector_2	−1.99	−2.13	−2.01	−2.01	−1.98	−2.03
	(1.68)	(1.66)	(1.68)	(1.68)	(1.68)	(1.68)
sector_3	−4.51†	−4.09	−4.50†	−4.49†	−4.53†	−4.50†
	(2.56)	(2.55)	(2.57)	(2.56)	(2.57)	(2.56)
sector_4	−1.34	−1.13	−1.34	−1.34	−1.34	−1.34
	(1.08)	(1.07)	(1.08)	(1.08)	(1.08)	(1.08)
sector_5	−2.00	−2.18	−2.04	−2.02	−1.99	−2.03
	(1.95)	(1.93)	(1.95)	(1.95)	(1.95)	(1.95)
sector_7	−2.15†	−2.01†	−2.19†	−2.15†	−2.15†	−2.18†
	(1.17)	(1.17)	(1.17)	(1.17)	(1.17)	(1.17)
sector_8	.35	−.08	.36	.35	.34	.35
	(1.95)	(1.94)	(1.95)	(1.95)	(1.95)	(1.95)
sector_9	2.78	2.84	2.78	2.77	2.78	2.77
	(2.57)	(2.54)	(2.57)	(2.56)	(2.57)	(2.57)
(Reference year 2004 and 2005)						
year 2006	−.31*	−.27†	−.31*	−.31*	−.31*	−.31*
	(.14)	(.14)	(.14)	(.14)	(.14)	(.14)
year 2007	−.59***	−.56***	−.60***	−.59***	−.59***	−.60***
	(.14)	(.14)	(.14)	(.14)	(.14)	(.14)
year 2008	−.79***	−.74***	−.80***	−.79***	−.79***	−.80***
	(.15)	(.15)	(.15)	(.15)	(.15)	(.15)

Table 3 (Contd)

Random effect model Handicap as dependent variable	**Model a** B (SE)	**Model b** B (SE)	**Model c** B (SE)	**Model d** B (SE)	**Model e** B (SE)	**Model f** B (SE)
year 2009	−1.14***	−1.12***	−1.27***	−1.07***	−1.04***	−1.02***
	(.14)	(.15)	(.15)	(.16)	(.16)	(.31)
year 2010	−1.41***	−1.38***	−1.54***	−1.35***	−1.30***	−1.29***
	(.15)	(.15)	(.15)	(.16)	(.16)	(.30)
year 2011	−1.65***	−1.61***	−1.77***	−1.58***	−1.53***	−1.52***
	(.17)	(.17)	(.17)	(.18)	(.18)	(.31)
Weather	.00	.00	.00	.00	.00	.00
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)
Constant	2.72***	22.71***	2.69***	2.69***	2.66***	2.59***
	(1.84)	(1.88)	(1.84)	(1.85)	(1.84)	(1.84)
R2-overall	.0310	.0543	.0307	.0314	.0309	.0311
Wald-chi	196.56***	227.96***	207.45***	198.01***	199.32***	208.11***
N	2222	2222	2222	2222	2222	2222
N-Groups	440	440	440	440	440	440
Obs_per_group:						
max	8.00	8.00	8.00	8.00	8.00	8.00
avg	5.00	5.00	5.00	5.00	5.00	5.00
min	1.00	1.00	1.00	1.00	1.00	1.00

Table 3 documents the random-effects regression results by using golf handicap as dependent variable. Model a is the basic model. The model entails the control variables and the (year-specific) management position of each person within our dataset. All management actors of interest are added as a binary variable in the regression; the group of retired managers (especially former CEOs and former chairmen) serves as control group and is not included in the model. Model a makes inferences about how the different management positions affect the golf handicaps. In Model b we therefore extend Model a by additionally including the effects on the development of golf handicaps of a management-position change within the observed time period. We test how each position holder's initial handicap scores change during a management-position change. In Models c-f we extend Model a by considering the changes in golf handicaps during the economic crisis, i.e., we test how each position holder's initial handicap scores change during the financial crisis.
In the table significant levels are highlighted as follows: †p < .10, *p < .05, **p < .01, ***p < .001.
We performed Wald tests about the parameters of the fitted model.

Exit" (chi2 = 24.90, p < .001). Further, the parameter for "Chairman becomes CEO" is not significantly different from "CEO becomes Chairman" (chi2 = 1.83), but significantly different from "Owner becomes CEO/Chairman" (chi2 = 3.51, p < .1) and "(Labor)Market Exit" (chi2 = 12.07, p < .001). The parameter for "CEO becomes Chairman" is not significantly different from "Owner becomes CEO/Chairman" (chi2 = .72), but is significantly different from "(Labor)Market Exit" (chi2 = 6.56, p < .05). Finally, the parameter for "Owner becomes CEO/Chairman" is not significantly different from "(Labor)Market Exit" (chi2 = 1.35).

Model b in Table 4 documents the results of a robustness check for the former findings. Instead of using a random-effects regression model we repeated the regression by using an OLS regression with robust standard errors. As indicated by the findings, the results are robust, i.e., all so far significant coefficients keep their sign and stay statistically significant.

Overall the results support Hypotheses 1a and 1b not completely, but in great part. Hypothesis 1a expected to find the strongest handicap deteriorations for persons switching to an owner position. While we cannot confirm that the change

Table 4

Robustness Test

OLS regression model with robust standard errors Handicap as dependent variable	**Model b** B (SE)	**Model f** B (SE)
Management Position (Reference Retirees)		
Owner	–5.01**	–4.20**
	(1.80)	(1.58)
CEO	–.92	–.90
	(1.58)	(1.38)
Chairman	–.13	–.11
	(1.61)	(1.36)
Management-Position Changes (Reference No Position Change)		
Become an Owner	4.36**	
	(1.69)	
Chairman becomes CEO	–4.49†	
	(2.38)	
CEO becomes Chairman	.14	
	(1.41)	
Owner becomes CEO/Chairman	–6.20***	
	(1.27)	
(Labor)Market Exit	.57	
	(1.75)	
Management Positions within the Crisis (Reference No Crisis)		
Owner × Crisis		–.63
		(1.24)
CEO × Crisis		–1.41
		(1.35)
Chairman × Crisis		–.87
		(1.26)
Constant	21.07**.***	21.61**
	(6.96)	(6.77)
Control variables included	Yes	Yes
R2-overall	.0940	.0726
F-value	3.65***	2.69***
N	2222	2222

Table 4 documents the OLS regression results with robust standard errors by using golf handicap as dependent variable. The results serve as a robustness check for the findings in Table 3. Models b and f entail the control variables and the (year-specific) management position of each person within our dataset. All management actors of interest are added as a binary variable in the regression; the group of retired managers (especially former CEOs and chairmen) serves as control group and is not included in the model. In Model b we additionally include the effects on the development of golf handicaps of a management-position change within the observed time period. We test how each position holder's initial handicap scores change during a management-position change. In Model f we consider the changes in golf handicaps during the economic crisis, i.e., we test how each position holder's initial handicap scores change during the financial crisis.
In the table significant levels are highlighted as follows: †p < .10, *p < .05, **p < .01, ***p < .001. We performed Wald tests about the parameters of the fitted model.

from a chairman to a CEO position is associated with more firm effort, the positive sign and the significant difference from chairman switching to CEO is significantly supported.

Hypothesis 1b expected highest positive changes for people leaving the labor market. The results give evidence that leaving labor market leads to a significantly better handicap and is significantly different from the other position changes (except for the "Owner becomes CEO/chairman" change). It supports the validity of handicaps as an effort measurement. It is very likely that people leaving a management position spend more time on leisure activities and thus improves their handicap. The assumption that leaving the owner position leads to a better handicap seems to be correct as well. While "Owner becomes CEO/Chairman" has a negative sign and the value is as predicted between the "(Labor)Market Exit" and "CEO becomes Chairman" parameters, we cannot clear that it is significantly different from "(Labor)Market Exit" and "CEO becomes Chairman".

The question remains about the size and importance of the former effects. Handicaps normally range from 0 up to 36. In our sample, the mean handicap is 18.64, demonstrating that a lot of excellent golfers are included. On average, a golfer improves his/her handicap in one year by 0.29 with a standard deviation of 1.47. Thus, a downward slide of 2.13 (as indicated by the "Become an Owner" coefficient), an improvement of −.68 (as indicated by our "CEO becomes Chairman" effect) or an improvement of −1.24 (as indicated by our "Owner becomes CEO/Chairman" effect) is a huge change in any case and clearly above an average change in a year. The changes indicate that a fairly lower (respectively higher) amount of practice time was required. Furthermore, especially better golfers have to invest a significant amount of time because the better the handicap, the harder it is to improve.[8]

Models c-f extend the basic Model a by considering the changes in golf handicaps during the economic crisis, i.e., we test how each position holder's initial handicap score changes during the financial crisis. To avoid multicollinearity Models c, d and e separately consider the interaction terms between management position and financial crisis. Model f includes all interaction terms at once. In line with Hypothesis 2, the findings in Model c show that the handicaps of owners significantly deteriorated by an amount of .66 ($p < .001$) during the financial crisis. Models d and e further reveal that CEOs and chairmen improved their handicaps during the financial crisis by an amount of −.21 and −.26. These improvements are, however, not significant. Considering all former effects jointly, Model f replicates the former results. During the financial crisis the handicaps of owners deteriorated by an amount of .41, and

8. The reason is that golfers with better handicaps already need less extra strokes. A further reduction of extra strokes by one stroke, therefore, is harder the better the golfer already is.

the handicaps of CEOs and chairmen improved by an amount of −.28 and −.27. Even though in Model f none of these effects is significant, the Wald-test confirms that the parameters for "Owner × Crisis" and "CEO × Crisis" (chi2 = 8.17, p < .01) and for "Owner × Crisis" and "Chairman × Crisis" (chi2 = 9.20, p < .01) are significantly different from each other. There is, however, no significant difference for the parameters for "CEO × Crisis" and "Chairman × Crisis" (chi2 = 0.00). It suggests that during the financial crisis owners spend significantly less time on the golf course as compared to employed managers, i.e., CEOs or chairmen. Recalling that on average, a golfer in our sample improves his/her handicap in one year by 0.29, the large handicap deterioration of owners by .41 points shows that for owners, the crisis seems to have strong effects. This indicates that the time for extended practice sessions was missing for owners and the golfers were not able to keep their level of playing potential. Compared to the −.27/−.28 improvement of CEOs and chairmen during the crisis, the owner position is much more demanding and requires more time in crisis compared to other management positions. Particularly with respect to the size of the handicap development, the results support Hypothesis 2, suggesting that in times of crisis, golf handicaps worsen most for owners.

Model f in Table 4 documents the results of a robustness check for the former findings. Instead of using a random-effects regression model we repeated the regression by using an OLS regression with robust standard errors. As indicated by the findings, the financial crisis results are not very robust. Even though the relative size of the obtained effects point in the same direction, the Wald-test confirms no significant differences for the parameters "Owner × Crisis", "CEO × Crisis" and "Chairman × Crisis". This suggests that the support for Hypothesis 2 must be seen with caution.

Finally, with respect to our control variables, the results in Table 3 indicate that the handicaps of golfers in our dataset improve over time. There are also some weak differences between sectors, supporting the ordinary assumption that the importance of golf for business varies between industries.

V. CONCLUSION

In this study, we tried to find a new approach to measure the effort of top managers. Our findings support Jensen and Meckling's (1976) theory that the higher the degree of ownership, the more agents allocate their time to business instead of to leisure activities. In contrast to prior empirical tests that use firm performance as an indirect measurement of agents' effort, we use golf handicaps as a direct measure of agents' effort. The more time someone invests in his/her firm, the less time he/she can spend improving his/her golf handicap. The

findings show that management-position changes worsen golf handicaps most for individuals who become owners, followed by chairmen becoming CEOs. Vice-versa, CEOs becoming chairmen, owners becoming employed managers (CEOs or chairmen), and managers who leave the labor market can improve their handicap significantly, which indicates that these changes are associated with having more leisure time.

Furthermore, in times of crisis, owners – who have the largest stake in the company output – show the highest extra effort, compared to CEOs and chairmen. Effort differences between management actors are especially visible during positional changes and an economic crisis. This effect can be explained by the loss aversion of individuals (Kahneman and Tversky, 1984). Owners hold the highest share of a company, implying that more of their own property is at risk. As a result, they respond most strongly during the uncertainty caused by positional changes or bad economic conditions and invest more time in the company instead of improving their golf handicap.

Like most research, our empirical sample used in this study has several limitations. First, it is restricted to one institutional environment, namely to top managers in Switzerland. Second, it is not a random sample, as only managers with a known golf handicap were included. Third, the sample could be larger. This would increase the underlying changes of positions and thus the robustness of the results. Fourth, the time period could be longer. For example, one could include additional times of crisis, e.g., the collapse of the dot-com bubble during 1999–2001. Last, the paper mainly concentrates on management by males, because there are few females who are both managers and golfers (we have only 23 females in the dataset). These limitations indicate directions for further research. Our approach suggests that the method could be transferred to other groups of agents or to alternative direct-effort measurements. Expanding the timeframe or analyzing different countries could give a deeper insight into the validity of using golf handicaps as a measure for manager's effort.

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SUMMARY

Economics suggests that owners, CEOs and chairmen have different claims in a company's output, and thus that these groups exert different efforts. However, the effort an agent invests in his/her firm is difficult to measure. Golf handicaps enable us to look into the relationship between different degrees of ownership and their implications for the effort that agents exert. Handicaps have the advantage that they can be directly observed and can be viewed as a mirror image of a manager's effort. We expect that times of crisis and changes in management positions influence golf handicaps, mostly for owners and, to a lesser extent, for CEOs and chairmen. Data of 440 Swiss top managers and their handicaps during eight years, from 2003 to 2010, strongly support this assumption.